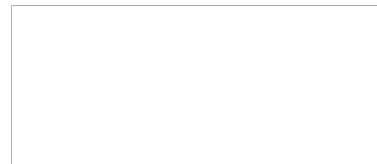
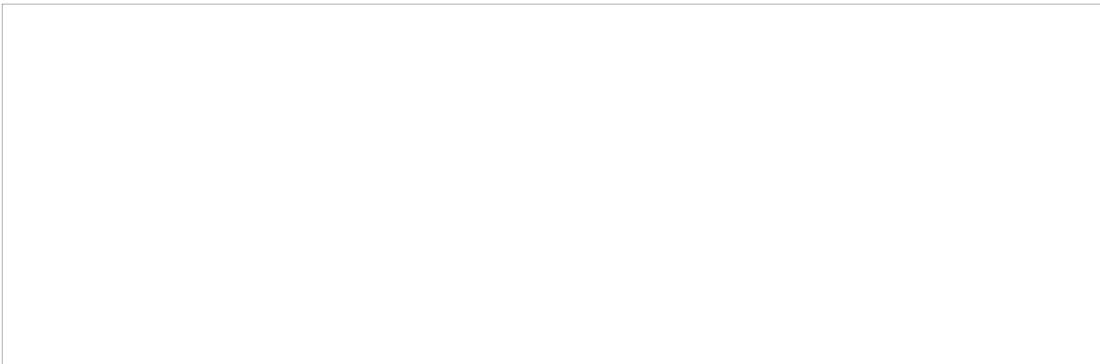


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THE OFFICIAL MAPS OF THE GERMAN LAENDER

PRESENT STATUS OF MAP WORK

The Cadastral-Elevation Map

Origin

In order to make the results of topographic field surveys available, on the original scale, for economic and industrial purposes, it has been the practice in Bavaria, since about 1910, to overprint original survey contour lines in brown ink on a 1:5000 cadastral map. At about the same time attempts began to be made to produce a uniform map of the German Reich as it was at the time, on the scale 1:5000, showing elevations. The first sample sheet and legend for the Basic Map 1:5000 were prepared in the years 1922-1925 by the Surveying Council. It was recommended to the various Laender that they produce the maps.

The German basic map 1:5000 is a contour map in at least two colors which shows, in addition to topographic features and terrain, the boundaries ~~and~~ of plots and the purpose for which the area is used. It was drawn in the Gauss-Krueger projection as a square grid map, and represents an area of 4 square kilometers. The grid coordinates are spaced on the map to indicate intervals of 200 meters. Each sheet is designated by the most important place name on the sheet and the grid coordinates of the southwest corner of the sheet. The last edition, thoroughly revised, appeared in 1937.

A decree of the German Ministry of the Interior designated the Basic Map--and its forerunner, the cadastral map 1:5000--as the basic maps for the Laender. Bavaria and Wuerttemberg were initially excused from work on these maps, since the cadastral maps available in these Laender, on scales of 1:5000 and 1:2500, respectively, and overprinted with brown contour lines, conformed to the requirements of the Basic Map.

Projection, Format, and Numbering

The cadastral map serves as the basis for the cadastral-elevation map. It is drawn in the Soldner polyhedral projection. Johann Georg Soldner selected an ideal sphere as a basis for plotting and representation. The radius of this sphere is the length of the normals through the point of origin as determined from the dimensions of the Laplace terrestrial ellipsoid. The ideal sphere is contiguous with the ellipsoid along the parallel of latitude which intersects the point of origin [sic], and is very close to the ellipsoid in the area covered by Bavaria.

The divisions of the cadastral map (formerly called the plane-table map) correspond to the general Land system. The axis of the pole atop the north tower of the Frauen-Kirche in Munich was designated as zero point of the Bavarian system; the center of the observation tower of the old Sternwarte in Mannheim was designated zero point for the Rheinpfalz. The zero meridian, which also forms the axis of abscissas, and the parallel through the zero point, on which the ordinates are measured, divide the areas of Bavaria and Rheinpfalz, respectively, into four regions: north-west, north-east, south-west, and south-east. The meridian itself, is marked off to the north and to the south of its mid-point, in segments of 800 rods (2334.8733 meters). The ordinate circles through these points are divided into similar segments by equidistant lines parallel to the axis of abscissas. The resulting network of almost square quadrilaterals forms the basis of the individual cadastral maps. The longitude of a given cadastral map is given in roman numerals, and the latitude in arabic numerals. Region, longitude, and latitude suffice to determine the position of each map.

In the regions where the land was broken up into very small holdings (Unterfranken and Rheinpfalz), the cadastral map was produced on the scale 1:2500. This was done by subdividing each sheet of the 1:5000 map into 4 parts. They were labeled with small Latin letters as follows:

a | b for Bavaria on the right bank of the Rhine
c | d

a | b for the Rheinpfalz
c | d

Each of the spherical trapezoids which corresponds to a given cadastral map is represented by a single plane surface determined by the 4 corner points of the sheet. The north and south sides of the sheet remain undistorted, while the east and west sides are somewhat shortened as a result of the convergence of the ordinate parallels. For a 1:5000 sheet this reduction in length is calculated as d (meters) equals $0.000156 n^2$ (n equals the latitude of the sheet) for the side of the sheet farthest away from the axis of abscissas.

Altogether the Bavarian cadastral maps form a segment of the surface of a polyhedron which closely approximates the ~~imaginary~~ sphere. Because of the convergence of the great circles toward the east or west poles, it is not possible to join adjacent sheets without leaving gaps unless they lie on the same parallel or meridian. Because each sheet covers an area of only about 5.4 square kilometers, the projection may be regarded as accurate with regard to surface and angles.

Contents and Execution

The cadastral-elevation map is a two-color contour line map. It uses the same basic framework as the cadastral map. The cadastral maps were surveyed on the plane table; they are expanded and kept up-to-date by orthorectinal measurement. In addition to boundaries of plots, they also show the use made of the land and the boundaries of such areas of use. The status of the basic framework always corresponds to the latest revision of the map on the basis of the cadastral measurements.

A blue-print is ~~made~~ ^{made} of the terrain representation (contour lines, cliffs, artificial and natural embankments, rocks, and a selection of

high points) as shown on the topographic map, and this is used to prepare a contour-line overprint plate 1:5000 for the brown overprinting. The brown impression also shows any changes, for example, in the courses of rivers or roads, which have not yet been entered on the original map.

For the regions for which the cadastral maps were made on the scale of 1:2500, the data on terrain formations are available on the same scale. Even in the case of the new surveys and new mapping of large cities on a scale of 1:1000, elevation data are usually included. The tachymetric network is made dense enough to permit the establishment of contour lines on the scale 1:1000. Corresponding cadastral elevation maps are also made on that scale.

Cadastral-elevation maps are prepared as needed, and only for areas for which field surveys more recent than 1895 are available.

The Topographic Map 1:25,000

The map series is incomplete because there have been no elevation surveys in some of the regions. In addition, maps produced to date have not been standardized. The sheets showing the southern half of the area and some northern districts were put out as position sheets. In the Rheinpfalz and in northern Bavaria, the topographic maps 1:25,000 appeared as degree-boundary sheets [sheets bounded by degrees of latitude and longitude.]

Position Sheets 1:25,000

Origin: The map drawings on a scale of 1:25,000, made during the years 1817-1872 by redrawing the original maps (4 x 4, or 16, 1:5000 cadastral sheets to each 1:25000 sheet) were called position sheets, and were not originally intended for publication. They were to serve merely as the basis for the composition of the topographic

atlas 1:50,000. These original designs had many colors and were unsuited for reproduction by facilities then available. From 1872 on, their photolithographic reproduction has been feasible.

Projection-Format-Numbering

The position sheet 1:25,000, like the cadastral map, is based on the Soldner polyhedral projection. The area covered by a position sheet is approximately 87 square kilometers.

The edges of the sheets are determined by the segments of the great circles or small circles which run perpendicular, parallel to the prime meridian of the Soldner ~~imaginary~~¹⁸⁷² sphere. The starting point (center of the north tower of the Frauenkirche) is in the center of position sheet 692, Munich. Sheets lying along the prime meridian are almost square, the natural length of one side being $4 \times 2,334.87$ meters or 9,339.5 meters, corresponding to 37.36 centimeters on the scale 1:25,000. The length of the north and south edges remains almost unchanged inside Bavaria, but the length of the east and west edges of the map is shortened somewhat because of the convergence of the great circles, the amount depending on how far the individual sheet is from the prime meridian. The distortion for west Unterfranken amounts to about 4 meters (0.16 millimeter on the scale of 1:25,000). For practical purposes, the trapezoidal sheets may be considered to be squares with sides of 37.36 centimeters each. Along the borders of the Land the sheet does not always correspond to 4×4 or 16 cadastral sheets. In order to reduce the number of sheets, the sheets were enlarged in certain cases by one row of cadastral sections or one degree of latitude from an adjacent sheet. In the southern part of the Land (below latitude line VII) the sheets were moved over the equivalent of one cadastral sheet to the east, which later proved disadvantageous. The pages are numbered serially, starting with the north-west part of the ~~province~~^{Land} and ending in the south-east.

Contents and Execution

Several changes have been made in the map over the course of time since its original publication. The execution of individual sheets is consequently not uniform. It changed from the original presentation (using shaded areas to denote contrast) to single- and, later, multi-color contour line presentation.

Since the 1:100,000 map of the German Reich was to be worked on at the same time, the drafting also underwent several modifications to make it conform with the latter. From 1901 on the legend was modified to correspond to the Russian plane table map on the scale of 1:25,000.

The original ~~impression~~ plates, with the exception of a few stone engravings, were produced by photolithographic process. After initially rather unsatisfactory attempts to overprint cadastral maps (which had been printed in blue ink) with contour lines and shaded areas and then reduce them to one-fifth the original size, after 1868 the individual 1:5000 sheets were reduced to a scale of 1:15,000 with the aid of a square grid net, and were then further reduced to a scale of 1:25,000 by a photomechanical process. A two-color reproduction was attempted in 1883. The shading method was abandoned, and the pages were put out with brown contour lines on a basic map drawn in black. The contour lines for the photolithographed basic map were engraved directly on stone on a scale of 1:25,000. To accelerate the work, single-color contour maps were printed in the interim. After 1894, two-color reproductions were customary. With the introduction of the photoalgraphic [sic] technique (about 1901), a third color - blue - was added to indicate water.

The map series was never completed: Of a total of 883 sheets only 496 were put out. Individual sheets are now being produced only if degree-boundary sheets for that region are not available. The

position sheets for north Bavaria are currently being redrawn as degree-boundary sheets.

Degree Boundary Sheets 1:25,000

Origin: The production of a topographic map 1:25,000 in the form of degree-boundary sheets was begun in the Rheinpfalz in 1902. The new format was chosen in the interest of the preparation of a uniform size and scale for all the German Laender.

Projection-Format-Numbering

The degree-boundary sheets were originally based on the Prussian polyhedral projection with the Bessel terrestrial ellipsoid as basis of reference. Each sheet of the map represents a spheroid trapezoid segment of the earth's surface, 10 minutes in longitude and 6 minutes in latitude, projected as a unit. As a result of the limited extent of the individual sheet (about 11 by 12 kilometers), the flat surface of the map may be considered equal to the corresponding section of the ellipsoid surface. The dimensions of the sheets correspond to the arc sections, reduced to the scale 1:25,000, of 10 minutes longitude and 6 minutes latitude. The east and west edges, which are formed by the meridians, are presented as straight lines. The north and south edges, which, strictly speaking, are the arcs of the parallels, are represented by the chords of those arcs. The parallels of latitude, which are not shown on the map, would fall just south of the chords marking the edges of the map. The curving of the parallels of latitude (on the Bavarian sheets it amounts to about 3 meters) is taken into consideration in plotting the map content so that no distortion results from the straightness of the north and south edges. Sheets along the same degree of latitude are congruent. An individual sheet may be considered to represent true length, angles, and area. If all the sheets are laid together the surface of a polyhedron is

obtained. If the sheets are laid out in a plane, only the space between two meridians or between two adjacent parallels of latitude is free of raps.

A degree-boundary sheet includes about 25 cadastral maps 1:5,000; the area varies between 131.4 square kilometers in the northern zone and 140.2 square kilometers in the southern zone of Bavaria.

Recently the individual degree-boundary sheets have been adjusted by use of the Gauss-Krueger transversal cylindrical projection, which gives true angles on a plane surface. Sheet limits are defined by the same method as the Prussian polyhedral projection. Since the curving of the 6-minute meridian arc sections cannot be depicted on the scale to which the map is drawn, the meridian lines on the east and west edges of the sheet become straight lines. The north and south edges are the chords of the projections of the parallels of latitude. The conformity of the projection results in an increase in the ratio of enlargement with the increase in the distance from the center meridian, ~~results from the conformity of the projection.~~ Sheets located far from the prime meridian are thus slightly enlarged. However, within a space of 3 degrees of longitude on the scale 1:25,000 the variations are within the limit of mapping accuracy.

The numbering of the topographic map 1:25,000 (degree-boundary sheets) was uniform within the Reich boundaries as they existed then. Bavarian sheets all have four digit numbers. The first two numbers indicate the east-west position, and they increase from north to south; the last two figures indicate the north-south position, and they increase from west to east.

Contents and Execution

The degree-boundary sheet is printed in three colors; black for the basic outlines, brown contour lines for the terrain, and blue for

water. The 1:25,000 sample sheet put out by the Reich Ministry of the Interior in 1939 was used for the cartographic work, with very few changes. One deviation was that contour lines were drawn throughout at intervals of 5 and 10 meters: 50 and 100-meter contour lines were indicated in heavier print. Only lines for full meters were used for intermediate contour lines (i.e., no lines for fractions of meters.)⁷

The basic outline for most sheets is drawn to a scale of 1:20,000 on aluminum covered cardboard, and is photoalgraphically transferred to the printing plate after reduction to a scale of 1:25,000. Terrain and water plates are either engraved in stone or set in copper. Because the copper plates can be corrected more easily, a number of sheets representing larger settlements were set up initially on copper plate for all three colors. 210 sheets had appeared up to 1948, of which 150 pertained to Bavaria on the right bank of the Rhine. The 60 sheets of the Rheinpfalz were worked on first.

The Topographic Atlas of Bavaria, 1:50,000

Origin: The development of the Bavarian topographic map began in the first part of the 19th century. The first sheets, of Munich and Wolfratshausen, appeared in the year 1812. The first complete edition of the atlas, covering the entire Land, was ready in 1867.

Before this date - after completion of the sheets for the area to the right of the Rhine - a new edition of the 47 oldest sheets had been decided on. Simultaneously, because of the awkwardness of the existing format, an edition was prepared in half-sheet format. Thus 86 of the 112 consecutively numbered sheets appeared with a supplement designation of "east" or "west", so that the entire atlas, including title and survey sheets, numbered 198 pages.

For one-sixth of Bavaria, the atlas is used at present in place of the topographic map 1:25,000 which has not yet appeared for that

area; in regions where contour lines have not as yet been mapped, it represents the most important basic topographic data.

Projection and Format

The topographic atlas is based on the Laplace ellipsoid with a flattening of 1:306. The representation is based upon the Bonne improper conical projection, with true-length concentric parallels of latitude, and a true-length straight line middle meridian.

The projection cone is contiguous with the earth ellipsoid along the 49th parallel of latitude. The meridian which passes through the Munich Sternwarte (latitude 48 degrees 7 minutes 33 seconds, longitude 29 degrees 15 minutes 56 seconds east of Ferro) was chosen as the prime meridian. Longitude degrees are positive from here to the west and negative from here to the east. The astronomical orientation was taken from the inaccurate 1802 Henry azimuth for Munich-Aufkirchen. To correct the orientation of the map, the grid net must be turned counterclockwise by 11.5 seconds.

The plane map area represented by the unrolled conical surface was divided into square sheets representing areas 40 kilometers wide by 25 kilometers high, in such a way that the old Sternwarte of Munich lies directly in the center of sheet 77. Subsequently followed the division into half sheets, east and west, each representing an area of 20 by 25 kilometers, or 500 square kilometers. Each point on the map can be indicated by right angle plane coordinates (projection coordinates). The north west corner of sheet 77 (Munich west) has, for example, the projection coordinates; x equals 12,500 meters, y equals 20,000 meters (using the old Sternwarte, Munich, and the prime meridian as starting points).

In the Bonne representation, the spheroid degree-boundary areas of the earth ellipsoid are represented by plane trapezoids with true-length parallels and elevations. Consequently, the projection is true

for area even to the smallest division. However, neither the length nor the angles remain true.

with the exception of the middle meridian and the parallel of tangency, the geographic gridlines no longer intersect at right angles. The angular and longitudinal distortion increases with increased distance from the prime meridian, and may become considerable in maps which show an area with a large east-west dimension. For Bavaria the distortion is slight, and is counteracted by the advantage of the accuracy of the area representation and the fact that it gives a cohesive plan reproduction.

A disadvantage of the representation is the undesirable slope of the grid lines as they intersect the straight edges of the sheet, in the case of those sheets which represent areas far from the middle meridian. This complicates the joining of the maps to maps of adjoining Länder.

The representation of the geographic grid at intervals of 5 minutes can be done with straight lines. The most sharply bent parallel of latitude on a half sheet (latitude 50 degrees, 30 minutes) is bent 9.2 meters, or 0.2 millimeters on the map scale. The most sharply bent meridian (longitude $4 \frac{1}{2}$ degrees) is bent 0.6 meters, or 0.01 millimeters on the map scale.

As a result of the more exact astronomical determination of the starting point, when converting from Ferro to Greenwich longitude, one must subtract 17 degrees, 39 minutes, 46.02 seconds - not the standard 17 degrees, 40 minutes.

Contents and Execution

The representation of the map content differed considerably at first, with regard to the reproduction of the communications net, vegetation, and the legend, from that of the topographic map 1:25,000. In the Color Edition, the symbols were first adapted to the German

Reich Map 1:100,000, and, later, to the German Map 1:50,000.

From 1895 on, elevations were measured from mean sea level. The individual sheets were marked to this effect in the upper left hand corner. Land forms were shown in the black and white version by vertical shading. This shading was first done at random; later the gradation was standardized with the introduction of the Lehmann technique of extending the shading scale in the Hochgebirge up to 60 degrees.

In the color edition of 1903 the basic outline is black, the terrain is indicated by brown contour lines at intervals of 20 meters, and water is indicated in blue ink.

Maps of high-mountain regions were shaded to give rather a 3-dimensional effect; in the multi-color map of Unterfranken, roads were indicated in red, and forests in green.

Of the three-color edition, 25 half sheets have appeared: 19 in the Alpine region, 2 near Munich, and 4 in Unterfranken.

With the exception of the two map sheets now in preparation for Murnau Ost and west, all the originals are on copper. To speed the work on the copper plates, heliography together with the galvanoplastic technique worked out in 1866 have been used in addition to hand-engraving.

Special Maps

The existence of a legible map on the scale of 1:50,000 made it appear desirable to produce a number of special maps from the Topographic Atlas, such as maps of localities, maps of mountains, and travel maps. They are designed to provide maps of cities and their environs, or of regions, with suitable boundaries, independent of the customary sheet divisions. Also, for the convenience of tourists, certain features of a map are represented in color - for example, on travel maps, roads and shelters ^{are} ~~were~~ indicated in red.

A 1:25,000 enlargement of the topographic atlas 1:50,000 was made

for those portions of Bavaria which as yet had no topographic map 1:25,000. The half sheets of the atlas were divided into four equal parts. Reference is made to these segments by the number of the original half sheet plus the letters Nw, NO NE, Sw, and SO SE.

The German Map 1:50,000

Origin: Agitation for the publication of a modern map on the scale of 1:50,000 came from South German Provinces. A new format was to be worked out in conjunction with the processing of the Palatinate atlas sheets into contour line maps.

In 1913 Bavaria, supported by Wuerttemberg and Baden, made the proposal at a conference of the Topographic Commission for the Standardization of Symbols to publish a uniform degree-boundary map of the German Reich on the scale of 1:50,000. The proposal was adopted, and Bavaria completed the first two sheets of this type of map for the Rheinpfalz. The production of this map series, the so-called "German Map 1:50,000", was delegated to the Laender by the Survey Council in 1923. The new map, originally covering four degree-boundary sheets 1:25,000, was expanded in 1931 to cover 15 minutes of latitude and 30 minutes of longitude (7 $\frac{1}{2}$ sheets of the 1:25,000 map). The work on the Reich atlas was defined by a decree of the Reich Minister of the Interior dated 31 May 1935, and was assigned to the Reich Office for Land Survey.

work on the new map was begun, and block lettering was introduced for map legends, but with the beginning of the second world war the work ceased. The sheets, finished in rough draft, were not published.

A total of 29 sheets appeared, in the old format, each covering 4 topographic maps of the scale 1:25,000. These were processed by the individual Laender. The following information pertains only to those of Bavaria.

Projection-Format-Numbering

The type of representation chosen was the Prussian polyhedral

projection based on the Bessel earth ellipsoid. Each sheet had an extent of 12 minutes width and 20 minutes length. The geographic grid follows the standard German system. Each sheet encompasses the area of 4 degree-boundary sheets 1:25,000. The numbers are consecutive for the entire German area and run from north west to south east.

Contents and Execution

The atlas was printed from copper in three colors (black basic outline, brown terrain features, blue water) on the basis of the topographic map 1:25,000. The symbols were standardized throughout the entire country. However, in the course of time, ~~some~~ map was revised several times. The last edition published included the same content as the tri-color atlas sheet of Munich 77 West.

Altogether 14 Bavarian sheets were prepared; 6 covered the Rheinpfalz area. When the German Map 1:50,000 was defined as a Reich map in 1935, no more work was done on this atlas in Bavaria. The sheets already published were not kept up-to-date.

Map of the German Reich 1:100,000

The Map of the German Reich 1:100,000 was the only complete, standardized map on a reasonably large scale which covered the whole of the former Reich.

This map took on the character of a national map as the result of an agreement signed by Prussia, Wuerttemberg, Sachsen, and Bavaria on 4 March 1878 in which they agreed jointly to further its publication. The Laender which were party to the agreement divided the work among them. Of the 675 sheets comprising the map, Bavaria had to produce 80. They were produced during the years 1883-1902, chiefly on the basis of the Bavarian topographic atlas 1:50,000.

By a decree of the Reich Minister of the Interior dated 31 May 1935, the former Reich Office for Land Survey in Berlin was given the full responsibility for the publication of the map of the German Reich 1:100,000. The original printing plates for all the Bavarian sheets and all special maps on the scale of 1:100,000 had to be handed over to this office in 1940. They were moved from there during the war, and are no longer available for use today.

Projection-Format-Numbering

The map is based on the Prussian polyhedral projection and the Bessel earth ellipsoid. The geographic grid is based on the Prussian land survey system. Each sheet is a trapezoid, and covers an area of 15 minutes width and 30 minutes length. The sides are formed by the chords of the plane projection of the geographic grid-line; to construct this trapezoid, it is necessary to know only arcs of the meridian and the parallel of latitude. The bending of the parallel of latitude for the latitudinal extent of Bavaria is about 30 meters; this was taken into account in plotting the map content. The area encompassed by the sheet varies from north to south from 980 square kilometers to 1,050 square kilometers. The individual sheets are numbered consecutively.

Content and Execution

The map of the German Reich 1:100,000 was originally published in one color. Elevation ^{was} ~~is~~ shown by vertical shading, using a combination of ^{H.} Lehmann and Meuffling methods. Slopes are indicated by hatching lines according to the formula:

$$\frac{\text{Heaviness of line}}{\text{Interval between lines}} = \alpha (45 \text{ degrees minus } \alpha).$$

For example, a slope of 5 degrees has a black-white relation of 1:8. There are nine gradations of 5 degrees each. Since a 45-degree slope is indicated by solid black, the formula was not suitable for very steep mountains. In the Alps the formula was extended to 80 degrees.

Since the use of hatching to indicate elevation is only approximately correct, it was supplemented in high mountain regions by the reproduction of 100-meter contour lines. Elevation throughout is based on sea level.

The map content is comparatively comprehensive. The entire communications net, including country roads and footpaths, is indicated. Villages are indicated in the basic outline. Their political significance and population are both indicated by the type of lettering. Forests, divided into deciduous, coniferous, and mixed, are reproduced in as much detail as the scale permits. Administrative divisions down to Landkreis or Stadtkreis are shown. Large rivers ~~were~~ indicated with a double line, and the lettering distinguishes between navigable and non-navigable waterways. Depths of large bodies of water ~~were~~ indicated by contour lines at intervals of 10, 50, and 100 meters, reckoned from the mean water level.

The topographic atlas 1:50,000 published in 1867 served as the basis for the Bavarian part of the map, with the exception of the sheets numbered 639, 661, and 674. The three sheets mentioned were based directly on the new topographic survey on the scale of 1:5,000.

The appropriate atlas sheets, already lettered, were provided with a geographic grid (Prussian system) at 2 $\frac{1}{2}$ minute intervals, were photographically reduced to the scale of 1:100,000, and were transferred one by one into the proper space in the geographic grid on the copper plate. Correction on the basis of trigonometric points was not made.

Multi-Color Editions

In order to increase the legibility of the map, two types of

multi-color editions were made up in Bavaria. One showed basic outline and legend in black, terrain in brown, and water in blue. The five-color edition showed basic outline, terrain, and water in black, roads in red, forests in green, meadows in yellow, and water over-printed in blue.

Special Maps

As a result of their standardized legend and complete coverage, the individual sheets of the Reich map 1:100,000 are very suitable for making special maps. These include the large sheets (4 sheets 1:100,000 in one), maps of localities and their environs, political maps (of Kreise), etc. The stone plates for these maps are also no longer accessible. Only scattered prints are still available.

The Administrative Map of Bavaria 1:100,000

With the help of a number of remaining plates, reprint plates, chalk prints, and ordinary map prints, plates for the entire area of Bavaria on the scale of 1:100,000 were prepared in 1947, by reprinting, combination printing, and photo-mechanical methods.

The selected format (which does not correspond to that of the large sheets) was dependent on a number of still available chalk prints on aluminum grid plates. The edges of the contiguous sheets, two or four, as the case may be, are indicated with a black separating line. For administrative purposes the administrative boundary lines down to Landkreise or Stadtkreise ^{and} ~~are~~ indicated in red.

It is true that this reprint is not as high in quality as the earlier edition of the Reich map 1:100,000; however it provides an acceptable substitute for this time-tested shaded map.

Munich and Environs 1:100,000

From the same basic material a map of the vicinity of Munich was printed. It includes the region from Freising to Bad Toelz, and from Ammersee to Kirchseeon. A five-color edition of this map has been

prepared.

The Map of Southwest Germany 1:250,000

The forerunner of the map of southwest Germany 1:250,000 was a 15-sheet survey map on the same scale showing the section of Bavaria on the right bank of the Rhine, published in 1853 by the Bavarian Topographic Bureau. It was in two parts (terrain and place maps) and was prepared at the same time the topographic map 1:50,000 was being published. Subsequently the terrain map was expanded and combined with the place map to produce the "Map of Southwest Germany," in 25 sheets. This work was begun in 1856 and finished in 1868. The individual sheets were for the most part prepared on the basis of the Bavarian topographic atlas 1:50,000.

Projection-Format-Numbering

As in the topographic atlas, the Bonne conical projection is used, with the Laplace ellipsoid (flattened in the ratio of 1:306) as reference. The conical projection coincides with the ellipsoid along the 49th parallel. Single sheets are square segments of the conic surface. They are 48 centimeters long and 30 centimeters high (equivalent to 9 full-size atlas sheets 1:50,000). They represent an area of 9,000 square kilometers. The geographic grid is based on the prime meridian at Ferro, and is drawn in at intervals of 15 minutes. In converting to Greenwich longitude, 17 degrees, 39 minutes 46.02 seconds must be subtracted from the Ferro meridian. The individual sheets are numbered consecutively from northwest to southeast. Sheet 1 contains title and legend for the entire series.

Content and Execution

The map is of the survey type with shaded terrain features. All large villages are indicated; small settlements are not indicated in all cases, in view of the scale. The railway net distinguishes only

between single and double lines. The road net shows autobahns, state roads, district roads, and municipal roads. Of the latter, only the most important ~~are~~^{are} shown; the same applies for side-roads and mountain paths.

The cities have an outline sketched in, and the legend divides them into three categories by size. The boroughs, villages, and hamlets are indicated by circles showing five categories by size. Forest is indicated by uniform tree symbols. The 25 original plates were engraved on copper, and appeared in a black and white reprint version.

Corrections were made only on the 14 sheets which represent principally Bavarian areas. Multi-colored versions were produced of these sheets: roads are in red, forests in green, and Land and administrative subdivisions in blue. This edition is now being revised.

Special Maps

By combining the individual sheets in to 5 large sheets, ~~the~~ N, NW, SW, and SE, ^(NOTE - this gives only 4) a road- and administrative district map 1:25000 was created. In this version state and district roads are indicated in red. Administrative boundaries down to Landkreise and Stadtkreise, are indicated in blue.

The Colored Elevation Map of Bavaria 1:250,000

In 1872 the Bavarian Topographic Bureau began work on a Hypsometric Map of Bavaria 1:250,000, on the scale and in the format of the map of southwest Germany. This map, which was to include the Bavarian region only, in 16 sheets, was completed by 1905 with the exception of sheet 15, which represented Reichenhall. Since the color legend of the elevation was not systematic and did not give any 3-dimensional effect, it was decided in 1906 to begin work on a new "Colored Elevation Map 1:250000 of Bavaria," using the Peucker 3-dimensional technique. Bavaria

on the right bank of the Rhine was to be represented on 9 sheets. So far only the three south Bavarian sheets, numbers 7, 8, and 9, have appeared. The printing plates (lithograph stones) are now available only in part. Consequently the map cannot be reprinted.

Projection-Format-Numbering

The representation, like that of the map of southwest Germany 1:250,000, is based on the Bonne conical projection, with the Laplace ellipsoid as reference. The individual sheets are twice the size of those in the Southwest Germany map (48 centimeters long and 60 centimeters high). The 9 sheets (6 full-size and 3 half-size) for the part of Bavaria on the right bank of the Rhine are consecutively numbered.

Content and Execution

The map shows the basic outline in black, the river net in dark blue, the lakes in bright blue, and contour lines in brown. The latter are indicated at intervals of 100 meters, and up to 500 meters the elevation is shown at 50 meter intervals by dotted lines. All 500-meter contour lines are heavy.

The color scale used to show elevation changes every 500 meters, from green to yellow, brown, and finally red. It gives a clear and 3-dimensional presentation, which is heightened by gray shading with illumination from the northwest. Regions outside Bavaria are indicated on this map only in a limited two color basic outline which does not indicate the elevation.

The map was prepared using the lithographic technique. The originals, some of which are still available, are on stone.

The Survey and Communications Map of Bavaria 1:500,000

Since the map sheets of the small-scale Reich atlas were hard to get hold of after 1945, and Bavaria had no official map which could serve as a survey map for both administrative and communications purposes, work

was begun in 1947 on an 8-color Bavarian survey and communications map on the scale of 1:500,000.

Projection and Format

The grid was drawn according to the Gauss-Krueger transverse-axis cylindrical projection, using the basic values of the Bessel ellipsoid. The map, consisting of two sheets, falls within a single meridian strip, with the meridian 12 degrees east longitude from Greenwich as the principal meridian. The two sheets (north and south halves) will be bounded by the meridians 8 degrees, 20 minutes and 14 degrees longitude, and by the parallels of latitude 47 degrees, 5 minutes, 48 degrees, 50 minutes, and 50 degrees, 35 minutes. The geographic ~~net~~ is indicated at intervals of 1 degree. The longitudinal distortion, which increases with distance from the basic meridian, remains within the limits of mapping accuracy even at the west edge of the map (the maximum distance from the basic meridian). A reprint of the two sectional sheets as one sheet has appeared.

Content and Execution

The survey and communications map of Bavaria 1:500,000 is in multi-color. The content is simplified in correspondence with the smaller scale.

The railways are divided into three categories, (standard-gauge main lines, narrow-gauge secondary lines, and mountain railroads). In the road net, the autobahns and main roads (with their numbers) are emphasized. The distances are noted in kilometers with large numerals for long stretches and smaller ones for the shorter distances.

The largest cities are outlined in the ~~ground plan~~ ^{basic plan}; all other towns are indicated with circular symbols. Considering the scale, the place names are numerous. The simplified river net and the lakes are shown in blue.

International boundaries and boundaries of Laender, administrative districts, Stadtkreise and Landkreise are differentiated. Place names of capitals are underlined.

Elevations are indicated in colors. In order to limit the number of press runs, only the following variations in elevation are indicated:

0	- 500 meters	color change for every 100 meters
500	- 700 meters	color change for 200 meters
700	- 1,000 meters	color change for 300 meters
Over	- 1,000	color change for every 500 meters

The various printing plates were made photomechanically from hand-drawn originals with lettering stamped in. The color plates for the gradations of elevation were made by a lithographic process.

The following official maps were used as a basis for this map: Survey map of Central Europe and auto map 1:300,000; map of Southwest Germany 1:250,000; topographical survey map of Germany 1:200,000; Hypsometric and colored elevation map of Bavaria 1:250,000; International World map 1:1,000,000; road survey maps of Bavaria, Wuerttemberg, Baden, and Hesse on the scales 1:200,000, 1:250,000, and 1:300,000; map of Wuerttemberg-Hohenzollern 1:150,000.

Other Maps

General

The following maps are simplified extracts on a smaller scale of the official maps. They have been left as uncluttered as possible, and are therefore especially suitable for making additions or for overprinting in color for administrative and statistical use.

Survey Map of Bavaria 1:500,000

The map is in two sections, (west and east). It is in one color, and does not indicate terrain or roads. The basic outline shows only the larger towns, the more important rivers, the railway net, and the administrative boundaries down to Stadtkreise and Landkreise.

Administrative Map of Bavaria 1:800,000

This map shows only the administrative boundaries down to Stadtkreise and Landkreise, with their names. With a red overprinting to show the boundaries of the sheets of the 1:100,000 administrative map of Bavaria, the 1:800,000 map can serve as a survey map for the 1:100,000.

Survey Map 1:1,250,000

The single color representation shows all administrative boundaries down to Kreis. The larger rivers and lakes are included for purposes of orientation.